

the sulphur compounds initially contained in the gasoline feedstock is concentrated, and at least one intermediate fraction having a depleted content of olefins and aromatics;

(c1) conducting at least one treatment of the heavy fraction separated at step (b) on a catalyst enabling the unsaturated sulphur compounds to be at least partially decomposed or hydrogenated; and

(d) conducting at least one step to remove the sulphur and nitrogen from at least one intermediate fraction.

12. A process as claimed in claim 11, further comprising at least one step (a2) prior to step (b) of increasing the molecular weight of light sulphur compounds present in at least one of the feedstock and the effluent from step (a1).

13. A process as claimed in claim 11, further comprising a step (c2) of treating effluent from step (c1) on a catalyst so as to decompose the sulphur compounds.

14. A process as claimed in claim 13, in which the hydrogenation of olefins in said effluent is limited to less than 20% by volume.

15. A process as claimed in claim 11, further comprising a step (e) of mixing at least two of said fractions, at least one of which was desulphurized at step (c1) and optionally (c2) and/or step (d).

16. A process as claimed in claim 11, in which a part of at least one intermediate fraction obtained from step (b) is mixed with the heavy fraction from step (b) prior to step (c1).

17. A process as claimed in claim 11, in which a part of at least one intermediate fraction obtained at step (b) is mixed with effluent from step (c1).

18. A process as claimed in claim 11, in which step (d) during which the sulphur and nitrogen are removed, further comprises hydrogenation of the olefins.